

ADDENDA TO THE AUSTRALIAN HYDROMEDUSÆ.

By R. VON LENDENFELD, PH.D.

Plates XL, XLI, XLII, XLIII.

In this paper a series of new or otherwise interesting species of Hydromedusæ from different Australasiatic localities, which I obtained after my papers on the Hydromedusæ were read, will be described, and a few erroneous statements corrected.

They are the following :—

I. SUBORDO HYDROPOLYPINÆ.

1. FAMILY. HYDRIDÆ.

1. GENUS. HYDRA. Linné.

2. HYDRA FUSCA. Linné.

This species must be struck from the list of Australian Hydromedusæ, because the specimens referred to it are identical with *H. oligactis*. Pallas.

5. FAMILY. BLASTOPOLYPIDÆ.

4a (70). GENUS. MONOSKLERA.

10b (231). M. PUSILLA. Nov. Spec.

An interesting representative of a new Genus from Port Phillip.

6. GENUS. LAFCEA.

18a (232). L. CYLINDRICA. Nov. Spec.

A new Species from the Bay of Islands, New Zealand, which is very similar to *Lafcea parasitica* Ciamician.

8a (71). GENUS. SYNTHECIUM.

21a (233). S. ELEGANS. Allman.

I obtained a specimen of this Species from Timaru, New Zealand.

9. GENUS. SERTULARIA.

63a (234). S. SIMPLEX. Nov. Spec.

An apparently new Species from Lyttleton, New Zealand.

10. GENUS. DIPHASIA.

69a (235). D. RECTANGULARIS. Nov. Spec.

An interesting new Species from Torres Straits.

14. GENUS. THUIARIA.

85. T. QUADRIDENS. Bale.

In a specimen from Timaru, New Zealand, I found the Gonophors which were hitherto unknown.

II. SUBORDO HYDROMEDUSINÆ.

9. FAMILY. ANTHOMEDUSIDÆ.

34. GENUS. SARSIA.

178. S. MINIMA. Von Lendenfeld.

I obtained the hitherto unknown adult Medusa of this Species in Port Jackson.

36a (72). PANDÆA.

180a (236). P. MINIMA. Nov. Spec.

A new Species of Haeckel's Genus Pandæa, from Port Jackson.

40a (73). GENUS. MARGELIS.

185a (237). M. TRINEMA. Nov. Spec.

A new species from Port Jackson.

11. FAMILY. LEPTOMEDUSIDÆ.

46a (74). GENUS. OCTORHOPALON.

197a (240). O. FERTILIS. Nov. Spec.

I obtained this interesting representative of a new Genus in Port Jackson.

49. GENUS. EUCOPE.

201a (239). E. HYALINA. Nov. Spec.

A large new Species obtained in Port Jackson.

50. GENUS. OBELIA.

203. OBELIA AUSTRALIS. Von Lendenfeld.

I obtained the hitherto unknown adult stage of this Medusa in Port Jackson.

12. FAMILY. CAMPANULINIDÆ.

59a (75). GENUS. CAMPANULINA.

214a (240). CALICULATA. Von Lendenfeld.

I have received specimens of *Campanularia caliculata*, Hincks, from Port Phillip, Victoria; and Lyttleton, New Zealand. I find, that this Species is not a *Campanularia* but a *Campanulina*.

The Species which are added to the Australian Fauna in this paper, bring the total number of Australian Hydromedusæ up to 240, which are distributed amongst 74 Genera.

I. SUBORDO HYDROPOLYPINÆ.

Von Lendenfeld.

5. FAMILY. BLASTOPOLYPIDA. Von Lendenfeld.

III. SUB-FAMILY. CAMPANULARINÆ.

4a (70). GENUS. MONOSKLERA (1). Nov. Gen.

Campanularinæ, with erect unbranched stems, which bear alternate Trophosomes on the distal ends of each Internode on short annulated stalks. Internodes wedge-shaped, with a cylindrical tube along one side. Gonophor, unknown.

(1.) From *μόνο* one, one-sided; and *σκληρά* thick skin.

Sb (231). MONOSKLERA PUSILLA. Nov. Spec.

Plate XL., Figs. 1, 2, 3.

The Hydrorhiza forms a network of minute threads, with elongate meshes, which adheres closely to the Thalloms of Macrocystis. The Hydrorhiza is thick-walled, and appears flattened on the side which is in contact with the seaweed. No such broad extension, however, is formed as in Eucapella. The colour of the Perisarc is light yellow. The Cœnosark contains in the Entoderm of the single specimen, which I obtained, and which was hardened with chromic acid, numerous round cells, which take up Carmin very freely; they may, perhaps, be considered as young stages of ova.

From this Hydrorhiza, erect and unbranched stems arise, which attain a height of 10-15 mm. (Fig. 1.) They consist of a row of Internodes, which are wedge-shaped, and twice as broad at the distal-end than at the proximal termination. These joints are fixed to one another in this way that the narrow end of one is always inverted into the broad and flat end of the preceding one laterally. They are alternate, in as much as the third Internode grows out from the left margin of the second; the second out of the right margin of the first. (Fig. 2)

These Internodes consist of solid light yellow, and perfectly transparent Chitin. They are perforated by a cylindrical tube, which runs along the slanting side (Fig. 1 and 2), and therefore appears regularly zig-zag-shaped. Between the Internodes the tube is slightly constricted.

From the upper end of the tube in each Internode (Fig. 3), a process extends to the other side of the Internode, a small sac-shaped excrescence of the cavity. This sac is in communication with the cavity of the Hydrotheca, by means of a tube which perforates the short peduncle of the Trophosome. The part of the Internode which is solid, appears compressed, as a ridge connecting the main tube with the sac-shaped excrescence. The Trophosomes are attached to the free part of the flat end of the Internode. They are, therefore, alternate. (Fig. 2.) Generally.

there is one Trophosome to each Internode, but sometimes there are two, close together. The Peduncle consists of two spherical parts, with incisions dividing them from the Hydrotheca, each other and the Internode of the stem. Strictures in the Cœnosark tube correspond to these. The Hydrotheca is cup-shaped, bi-lateral, symmetrical, the outer margin a little higher than the inner, so that the oval aperture looks obliquely forward.

The Cœnosark of the stem does not contain the highly colourable cells found in the Hydorhiza.

The alimentary zooids possess 10-15 stout tentacles and a short proboscis, but otherwise appear similar to other Campanularians or Leptomeduse-Polyps. There is a decided "floor" to the Trophosome.

Locality.—Port Phillip.

6. GENUS. LAFOEA. Lamourroux.

18a (232). *L. CYLINDRICA*. Nov. Spec.

Plate XL, Figs. 4, 5.

Ciamician (1) described a species of this genus as *L. Parasitica*, from the Adriatic. I have recently obtained a similar *Lafœa*, which, however, is not identical with Ciamician's species.

The Hydorhiza is creeping, and closely adnate to the stem of other Hydroids, mainly Sertularians. It appears very small and slender, and is not smooth. It runs in a straight line, and keeps to the same side of the Hydroid and is attached throughout, as is also the case with *L. Parasitica*. From this creeping stem large Hydrothecæ arise, which are borne on very short and extremely narrow peduncles. (Fig. 5.) The Hydrotheca is mainly cylindrical and thin walled, large as in *L. Parasitica*. The margin is recurved so that it attains a trumpet shape. Near the bottom, which appears semi-spherical we find a perforated disc, forming a ring near the base of the Hydrotheca. Although the Trophosome of *Lafœa* is considered always to be destitute of a floor, I do not hesitate to consider this species as a true *Lafœa*.

(1.) *T. Ciamician* Ueber *Lafœa parasitica*, n. sp. Zeitschrift für Wissenschaftliche Zoologie. Band XXXIII. Seite 673.

Gonophores unknown. The Hydianths are large, and possess about 20 stout tentacles.

It appears doubtful whether our species should be considered parasitic, as I failed to find any organs by means of which it might extract nourishing material from the Hydroid to which it clings. It appears to me rather as if the only use the *Lafœa* makes of the *Sertularia* on which it grows, was to use it as a support. *Lafœa Cylindrica* is therefore to be termed "climbing" rather than parasitic.

Locality: Bay of Islands, New Zealand.

IV. SUB-FAMILY SERTULARINÆ.

8a (71). GENUS. SYNTHECIUM. Allman.

Sertularinæ, with opposite alimentary zooids, and with Gonophors which appear to grow out from an ordinary Hydrotheca which surrounds the peduncle of the Polypostyl.

21a (233). SYNTHECIUM ELEGANS. Allman.

Allman (1) describes this interesting Hydroid from New Zealand. It appears that Bale (2) had his doubts about it, as he does not mention it in the catalogue. I have, however, found a small fragment on a sea-weed from an unknown locality, which corresponds to Allman's description.

9. GENUS. SERTULARIA. Hincks.

63a (234). SERTULARIA SIMPLEX. Nov. Spec.

Hydrocaulus simple, Hydrothecæ opposite, a pair to each Internode, conic aduate throughout their whole length, and straight, the outer surface at an angle of about 30° to the axis of the stem; aperture, simple oval; margin, entire and smooth, lying in a plane vertical to the axis of the stem. The margin is prolonged into a short conic process, looking outward on the side everted from the stem.

(1.) *G. T. Allman*. A Monograph of the Gymnoblasic or Tubularian Hydroids. (Ray. Society for 1870, Vol. II., page 229.)

(2.) *W. Bale*. Catalogue of the Australian Hydroid Zoophytes.

The stem is simple, unbranched, and rises from a reticulate Hydrorhiza to a height of 12-18 mm.

Gonophores oblong, rather large, on short peduncles.

Locality : Lyttleton, New Zealand.

10. GENUS. DIPHASIÆ. Agassiz.

69a (235) DIPHASIA RECTANGULARIS. Nov. Spec.

Plate XLI., Figs. 6, 7, 8.

From an anastomosing thick Hydrohiza, which is adnate to shells and other hard bodies, thick and rough, straight stems grow forth, which attain a height of 9 Cm. They taper towards the top. These stems bear alternate Pinnæ, which are shorter towards the end, and appear longest near the base, from 2 to 14 mm. in length. Towards the tops, where growth is going on rapidly, the Hydrothecæ stand at right angles to the stem. Pinnæ, and stem bear the Hydrothecæ which are close to one another, and appear biserial, but otherwise disposed in a very irregular manner. Further down the stem and Pinnæ they are disposed in a perfectly regular manner. Here they are distant and alternate. (Fig. 7.) They are tubular, and bent in the shape of a knee, at a right angle in the middle of their length. The proximal half is immersed in the stem, and nearly parallel to it, whilst the distal half is turned outward, and projects at right angles. The Hydrotheca has a circular transverse section throughout. The aperture is simple, smooth, oval, and looks obliquely outward and forward. (Fig. 7.)

The Gonophors spring from the stem at the bases of some of the Pinnæ. (Fig. 6.) The male Polypostyls are invested by a very pretty Gonangium. (Fig. 8.) It is conic, attached with the small end to a minute peduncle. the sides convex, and the base slightly raised towards the circular aperture in the centre. Eight or more ridges run from the aperture to the peduncle. The surface between them is depressed into as many valleys, which are particularly well marked on the sides. From serrate projections in the ridges transverse lines take their origin, which cross the valleys between the ridges. The ridges on the flat base of the cone are smooth.

Female Gonophores unknown.

Locality: Torres Straits.

14. GENUS. THUIARIA. Fleming.

85. THUIARIA QUADRIDENS. Bale.

Plate XL, Fig. 9.

This species has been described by Bale (1). The Gonophores have not been found hitherto. A specimen which I obtained from Timaru, New Zealand, bears Gonophores. (Fig. 9.) They are pretty large, barrel-shaped and annulated. Transverse ridges run round them like hoops. These are particularly well visible in the distal part and less distinct towards the rounded base, which is sessile on the stem.

II. SUBORDO HYDROMEDUSINÆ.

Von Lendenfeld.

9. FAMILY. ANTHOMEDUSIDÆ. Von Lendenfeld.

I. SUB-FAMILY. CODONINÆ.

34. GENUS. SARSIA. Lesson.

178. SARSIA MINIMA. Von Lendenfeld.

I described (2) this species in a former paper and have now obtained a series of small Medusæ, which lead up from the small young Medusæ which were produced by the Polypcolonies in my Aquarium to adult Sarsia. I obtained all intermediate stages with the surface net in early spring in Port Jackson.

The adult Medusæ, filled with ripe generative elements, is about four times the size of the larva at the time of liberation. The shape is the same with the exception of the gastral tubular Gonad. The Medusa is $2\frac{1}{2}$ mm. broad and 3 mm. high. The manubrium slightly shorter in proportion than in the larva.

(1.) *William Bale*. Catalogue of the Australian Hydroid Zoophytes. page 119

(2.) *Von Lendenfeld*. The Australian Hydromedusæ, Part V. Proceedings of the Linnean Society of N.S.W., Vol. IX., p. 584, pl. XXI., fig. 34.

II. SUB-FAMILY. TIARINÆ.

36a (72). GENUS. PANDÆA. Lesson.

Tiarinæ, with numerous tentacles (8-16) or more in one row. Abaxial Ocelli, outside on the base of the tentacle. No peduncle to the stomach. Edges of stomach connected with the radial canals in the Sub-umbrella by four mesenteria. Four simple Gonads with smooth surface. Longitudinal lines of thread cells on the Ex-umbrella. Polypeolonies unknown.

180a (236). PANDÆA MINIMA. Nov. Spec.

Plate XLII., Figs. 10, 11, 12.

The Medusa is semi-ovate, higher than broad. It possesses eight tentacles of about the same length as the Umbrella. There are eight nettle-cell-lines on the Exumbrella at equal intervals, which are situated in the Adradiis, but they do not appear continuous. They consist apparently of a series of elongate nettle-warts. (Fig. 11), which taper to a narrow line at each end. The line can be traced from one nettle-wart to another. All appear connected by it. Subjected to slight maceration the covering Exumbrella Epithel becomes loose and floats away when the cover glass is tapped. (Hardening with weak osmic acid and macerating with weak acetic acid, the time that is necessary for exposure to the latter re-agent depends on the temperature and varies from half an hour to twelve hours.) Then the Sub-epithelial layer becomes more clearly visible and with a high power. (Zeiss $\frac{1}{12}$, Fig. 12.) It is easy to recognize a nerve fibre in the thread which connects the nettle-warts with one another.

The nerve fibre consists of similar fibrils and bipolar ganglia cells as those which I described (1) in the homologous organ of *Encopella Campanularia*.

In another paper (2) I have pointed out that the Cnidoblasts

(1.) *Von Lendenfeld* *Encopella Campanularia*. Zeitschrift für Wiss. Zoologie, Band XXXVIII. Seite 558.

(2.) *Von Lendenfeld*. Ueber Wehrthiere and Nesselzellen. Zeitschrift für Wissenschaftliche Zoologie, Band XXXVIII. Seite 368.

are connected by one thick fibre with the supporting lamella or gallert, and by a thin fibril, probably with the Sub-epithelial plexus of ganglia cells.

This hypothesis I tried to prove by additional facts (1) published in another paper.

Korotneff has recently (2) found a similar structure in the nettle-bulb of Praya, where, besides the thick peduncles, which he considers as muscular, fine and granulose Nerve-fibres are described, connecting the Cnidoblast with a Ganglia cell.

Although working at the unparalleled Zoological Station at Naples he is apparently unacquainted with my discovery, published in the papers mentioned above a year previously, he describes the same thing which I have discovered. He has, however, not been led to the very simple conclusion which I drew from the fact, and overlooks the great importance of it concerning the physiology of Thread-cells altogether.

The stomach of our Medusa is slender, and about half as long as the Umbrella. The Mesenteria which connect it with the Radial Canals are inconspicuous and transparent. The Gonads are four longitudinal, narrow folds, with smooth surface. There are four small lips to the mouth.

Size : Height of Umbrella, 3 mm. Breadth, 2mm.

Colour : Umbrella, light pink. The nettle-lines more intensely coloured. Stomach and tentacle-bulbs light brown.

Locality : Port Jackson.

Season : Spring, August, September.

III. SUB-FAMILY MARGELINÆ.

40a (73). GENUS. MARGELIS. Steenstrup.

Margelinæ, with ramified or composite mouthstyles, and with four perradial bundles of tentacles. Stomach small, without peduncle, with narrow basis attached to the point, where the

(1.) *V. Lendenfeld*. Zur Histologie der Actinien. Zoologischer Anzeiger. Band VI. Seite 189.

(2.) *A. Korotneff*. Zur Histologie der Siphonophoren. Mittheilungen der Zoologischen Station in Neapel. Band V. Seite 264. Tafel 18. Fig 80.

four Radical Canals meet. No elongated Manubrium. Mouth narrow. Mouth styles touching at the base. The Gonads do not extend to the Radial Canals. The Polypecolonies are branched; the alimentary Polyps possess one vertical of filiform tentacles, the Medusæ, but on peduncles, which arise out of the Hydrolhiza.

185a (237.) MARGELIS TRINEMA. Nov. spec.

Plate XLI., Fig. 13.

Umbrella semi-spherical, a trifle higher than broad. Stomach short, cylindrical, nearly half as long as the Umbrella; not quite so broad as long. Gonads in the shape of four pair of oblique folds. The folds ascending towards the primary Radii. Mouthstyles about as long as the stomach, the margin of the mouth between the styles straight. Each style bears at its end three small equal branches, about a third as long as the style. These mouth-styles are carried upward.

The Tentacle-bulbs are small, broader than high, and thick. From each bulb three tentacles take their origin, which are about half again as long as the Umbrella; also the tentacles are curved upwards terminally (Fig. 13.)

Colour: Medusa colorless. Entoderm of stomach and tentacle bulbs dark yellow.

Size: Diameter of Umbrella, 2-3 mm.

Ontogenesis: I have found some *Bougainvillia*'s in Port Jackson, which are similar to *B. ramosa*. They are the only Hydroid Polyps resembling that Genus, which I have met with in Australian waters.

It seems therefore not unlikely that they are different stages in the cyclus of development of our *Margelis trinema*. Both however, Medusa and Polyp are rare, so that not much reliance can be placed on that assumption.

Locality: Port Jackson.

Season: Early Spring.

11. FAMILY. LEPTOMEDUSIDÆ. Von Lendenfeld.

I. SUB-FAMILY. THAUMANTINÆ.

46a (74.) GENUS. OCTORHOPALON (1.) Nov. gen.

Thamantinæ with four Radial Canals and four Gonads, eight tentacles, and eight clubs, in the intervals between the tentacles one in each Octant.

This new Genus belongs to Haeckel's Sub-Family Laodicidæ (2), and appears very nearly related to his Genus Octonema, from which it differs by the absence of Cirrhi, and by the small number (8) of the marginal clubs.

197a (238), OCTORHOPALON FERTILIS. Nov. spec.

Plate XLII., figs. 14-15.

Umbrella semiovate, much higher than broad. Stomach representing a double four-sided Pyramid, Octædral, widest in the middle. Tips of the mouth produced into four inconspicuous extensions at the corners. Intervening parts of the margin concave. Gonads very large and extending all about the Radial Canals. The four Gonads are joined around the stomach. They are richly folded transversely.

The tentacles about two-thirds of the length of the Umbrella. The perradial ones longer than the interradianal ones. The bulbs at the bases of the tentacles not large, elongate. The clubs large, elongate-oval, a little longer than the tentacle bulbs.

Colour : Gonads reach orange yellow. Medusæ otherwise colourless.

Size : Height of Umbrella, 2.5 mm., breadth, 2 mm.

Ontogenesis : Unknown.

Locality : Port Jackson.

Season : Early spring.

(1.) ὀκτώ, eight ; σ'οπαλον, a club.

(2.) Haeckel. Das System der Medusen. Seite 125.

III. SUB-FAMILY. ENCOPINÆ.

49. GENUS. EUCOPE. Gegenbaur.

201a (239). EUCOPE HYALINA. Nov. Spec.

Plate XLII., Figs. 16, 17, 18.

Umbrella flat, nearly watch-glass shaped, more than twice as broad as high. Gallert in the centre, exceptionally thick. The stomach half as long as the Umbrella is high and a little broader than long. Margin extended, with irregular small flaps. The 4 Gonads are oval and grow out from the distal third of the four Radial Canals. Eight tentacles about as long as the Umbrella is high with conic basal tentacle bulbs. Eight adradial large vesicles. There are always three Otolithes on each vesicle. The vesicles (Fig. 18) are spherical and attached to the cushion of elongated sensitive cells with long ciliæ by a broad and short peduncle

Colour: Medusa extremely transparent. Gonads and stomach pale yellow.

Size: Diameter of Umbrella 6 mm.; height 3 mm.

Ontogenesis: Unknown. I have found numerous different species of Campanularians which have not been described, because their Gonophores were not seen. There is no one of these more likely than any other, to be the Polypecolony belonging to our Eucope.

Locality: Port Jackson.

Season: Early spring.

50. GENUS. OBELIA. Péron et Leseur.

203. OBELIA AUSTRALIS. Von Lendenfeld.

Plate XLIII., Figs. 19, 20, 21, 22.

I (1) have described this species from the Polypecolonies and the young larvæ, which I obtained in Port Jackson. Since then I have obtained the adult Medusa, apparently belonging to this

(1.) *Von Lendenfeld*. The Australian Hydromedusæ. Part V. Proceedings of the Linnean Society of N.S.W., Vol. IX., p. 604.

species. The Umbrella is flat, and always reversed. I have examined hundreds of these *Obelias* lately, and have always found the Umbrella in this apparently abnormal state. But as these *Obelias* seemed perfectly healthy, and were obtained together with other *Medusæ* which never reverted the Umbrella, I am led to suppose that this is their natural position. All *Obelias* seem to have the extraordinary habit of reverting the Umbrella, and even of fastening themselves to foreign bodies by means of the mouth.

Whilst the other Australian species, *O. geniculata*, is often found with non-reverted Umbrella, and also the young larvæ of *O. Australis* present that appearance, I have never seen an adult *Medusa* of this species in another position from that represented in the figure. (Fig. 19.)

The Gonads are situated in the distal part of the Radial Canals, oval and thicker at the distal than near the proximal end. The Radial Canal widens at the proximal end continuously into the cavity of the Gonad. In the distal end the Radial Canal enters and widens abruptly into the fundus of the cavity. (Fig. 21.)

The male genital products are produced by a continual division and subdivision of the cells in the Subumbral wall of the Gonad. A thin layer of Ectodermal Epithelium covers the Gonad. It appears as if the Spermatother cells were Entodermal. The division of the cells goes on more rapidly towards the cavity, so that these cells always appear smaller (fig. 21e) than the outer ones (g). From the inner surface lines extend centrifugally (fig 27f), and it appears that these lines are minute channels in connection with the Gastral cavity, through which nourishing material flows to the growing *Spermatozoa*.

The stomach (fig. 19) is spherical, and we find attached to it a short Manubrium, with four short, cylindrical Moutharms in the Perradii. Looked at from above the stomach appears quadrangular. (Fig. 20.)

The tentacles are from 30 to 40 in number, and inserted in the margin of the Umbrella by means of a plug-shaped (fig. 22a) centripetal process (1).

Eight adradial Otolithes at the side of adradial tentacle-bulbs.

12. FAMILY. CAMPANULINIDÆ. Von Lendenfeld.

No Australian representatives of this family were known hitherto. I have had occasion to examine the Gonophors of some Hydroids, which are apparently identical with *Campanularia Caliculata* Hincks; and I find that they are *Medusostyles*. Therefore I consider myself justified in placing this well-known Hydroid in this family.

59a (75.) GENUS. CAMPANULINA. Von Lendenfeld.

Campanulinidæ, which consist of Polycolonies invested by a chitinous Perisarc, and containing alimentary zooids, with one verticil of filiform tentacles, invested by a radially symmetrical cup on a peduncle, Polypostyles, which grow from the *Hydrorhiza* in the shape of trumpet-like tubes, and *Medusostyles* budding at their sides.

Connected by *Eucapella* with *Eucopella*.

214a (240). CAMPANULINA CALYCVLATA. Von Lendenfeld.

Var. Makrogona.

In my paper on *Eucopella* (2) I referred to a Hydroid from Port Phillip, which is very similar to *Eucopella*, and which I believed to belong to the above species. I have since obtained specimens with Gonophors, and find that it is identical with *Campanularia Caliculata*, Hincks (3) and Allman (4), and with

(1.) Compare *Allman*. Monograph of the Gymnoblasic or Tubularian Hydroids. Vol. I. Page 142.

(2.) *R. von Lendenfeld*. *Eucopella Campanularia*. Zeitschrift für Wissenschaftliche Zoologie. Band XXXVIII., Seite 499.

(3.) *T. Hincks*. On some new British Hydroids. Annal. and Magazine of Natural History, 2nd series, March, 1836.

(4.) *G. T. Allman*. On the structure of the Reproductive Organs in certain Hydroid Polypes. Proceedings of the Royal Society of Edinburgh for 1857-58.

Campanularia Breviscypha, Sars (1), Agassiz (2) describes it as *Clythia poterium*.

In the variety *Makrogona*—all Australian specimens belong to it—the Gonophors are nearly as high as the Hydrocaulus of the Trophosome, and 8-10 times as large as the Hydrotheca.

Medusoid buds are produced in the Gonophor, which do not become free, in fact they do not possess a properly developed Umbrella at the time when the sexual products are matured. Judging from Hincks's (3) figure, the European *Campanulina caliculata* produces similar Medusoid buds, and I therefore do not hesitate to place this species in this family. It appears, as I have often taken occasion to mention, extremely likely, that many other species will wander from the *Hydropolypinæ* to this Subordo, so particularly the Genus *Sertularia*.

EXPLANATION OF PLATES XL. TO XLIII.

- Fig. 1.—*Monosklera pusilla*, R. v. L. A small Colony in Natural size.
 Fig. 2.—*Monosklera pusilla*, R. v. L. Part of a shoot. AA., Oc. I.
 Fig. 3.—*Monosklera pusilla*, R. v. L. An Internode with two Hydrothecæ. C., Oc. II.
 Fig. 4.—*Lafœa cylindrica*, R. v. L. A, Oc. II.
 Fig. 5.—*Lafœa cylindrica*, R. v. L. C., Oc. I.
 Fig. 6.—*Diphasia rectangularis*, R. v. L. Natural size.
 Fig. 7.—*Diphasia rectangularis*, R. v. L. Part of a pinna. AA., Oc. II.
 Fig. 8.—*Diphasia rectangularis*, R. v. L. A male Gonophore. AA., Oc. II.
 Fig. 9.—*Thuiaria quadridens*, Bale. With a Gonophore. AA., Oc. I.
 Fig. 10.—*Pandæa minima*, R. v. L. A., Oc. III.
 Fig. 11.—*Pandæa minima*, R. v. L. An Exumbral Meridional-line. C., Oc., II.
 Fig. 12.—*Pandæa minima*, R. v. L. Part of the Exumbral Meridional-line treated with osmic and acetic acid. $\frac{1}{12}$, Oc. I. The outer Epithel removed from the upper part of the Figure.

(1) *G. O. Sars*. *Campanularia Breviscypha*. Bidrag til Kundskaben om Middelhavets Littoral-Fauna, 1857, 49, pl. 1, figs. 12, 13.

(2) *L. Agassiz*. *Clythia poterium*. Contribution to the Natural History of the United States Aculephæ, Vol. IV., p. 297, pl. XXVIII.

(3) *T. Hincks*. A History of the British Hydroid Zoophytes, Vol. II., pl. XXXI, fig. 2d.

- (a) Ordinary flat Epithel-cells.
- (b) Nervefibre.
- (c) Nettle cells.
- (d) Bipolar Ganglia cell.
- (e) Irregular Ganglia cell of the nettle-wart.
- (f) Subepithelial cell producing nettle capsules.
- (g) Nerve fibrills radiating out from the fibre to the different parts of the nettle wart.

Fig. 13.—*Margelis trinema*, R. v. L. A., Oc. III.

Fig. 14.—*Octorhopalon fertilis*, R. v. L. A., Oc. III.,

Fig. 15.—*Octorhopalon fertilis*, R. v. L. The Medusa seen from below. AA., Oc. II.

Fig. 16.—*Eucope hyalina*, R. v. L. A., Oc. III.

Fig. 17.—*Eucope hyalina*, A. v. L. Longitudinal section through the stomach and the commencement of a Radial Canal, osmic acid, alum-carmin. F., Oc. II.

Fig. 18.—*Eucope hyalina*, R. v. L. An acustice vesicle with three Otolithes. A fresh compressed specimen. DD., Oc. II.

Fig. 19.—*Obelia Australis*, R. v. L. AA., Oc. II. A Medusa with reverted Exumbrella.

Fig. 20.—*Obelia Australis*, R. v. L. The mouth seen from below. AA., Oc. II.

Fig. 21.—*Obelia Australis*, R. v. L. Longitudinal section through a growing male Sexual Organ, osmic acid, picro carmin. DD., Oc. I.

- (a) Proximal part of Radial Canal.
- (b) Granulose part of the Umbrella Gallert just below the Sexual Organ.
- (c) Ordinary Entoderm on the upper side of the Sexual cavity.
- (d) Distal part of the Radial Canal.
- (e) Mass of small, indistinct cells, with Protoplasm which does not refract the light very strongly.
- (f) Minute Canal leading from the cavity into this mass of cells.
- (g) Larger and well separated cells, filled with highly refracting Protoplasm near the outer surface.
- (h) Ectodermal Epithel.

Fig. 22.—*Obelia Australis*, R. v. L. Base of one of the Tentacles. A fresh specimen compressed. C., Oc. I.

- (a) Plug-shaped transparent mass inserted into the margin of the Umbrella.
- (b) Proximal wall of the Ring canal.
- (c) Ring canal.
- (d) Distal wall of the Ring canal.
- (e) The rudimentary rest of the Velum.
- (f) Large Ectodermal cell of the tentacle-bulb.
- (g) First Entodermal cell of the Axis of the Tentacle.
- (h) Conic extension of the cavity of the Ring canal into the Tentacle.